Executive Summary
Market Relevance of Nanotechnology
FAA Contract DTFA03-01-C-00039 to the
Transportation Center at Northwestern University

The emerging fields of nanoscience and nanoengineeringó the ability to work precisely at the atomic and molecular levelsó are leading to unprecedented understanding of and control over fundamental building blocks of all physical things. There is clearly great applicability of prospective developments in nanotechnology for transportation; nowhere is this more promising than in aviation.

While nanoscale R&D holds great promise for civil aviation, to date there has been no systematic attempt to relate the outcomes of present and prospective research to the aviation sector. The outcome of the study will identify and describe a representative set of nanoscience and nanotechnology efforts having prospective relevance to civil aviation sectors, with emphasis in the United States.

The analysis will identify numerous nanoscale R&D efforts with great market relevance for civil aviation and the FAA. As such, it will help to guide the FAAís decision making with regard to the resources to be deployed to support nanoscale R&D and the timing of such commitments. The following approach will be used.

Survey nanoscale R&D. NUTC shall develop a ìcatalogî of present and prospective nanoscale R&D efforts in the United States. To the extent possible, the nature of the projects and their objectives will be developed. The sources to be surveyed will be primarily scientific and professional journals, government reports and personal contacts with nanotechnology researchers in both the public and private sectors.

Specifically, locations to be explored and the strategy for the survey include:

- ***Government laboratories.*** Select a priori about 50 from the list of some 700 laboratories and examine their websites. List applicable projects, with any descriptions provided. Compile telephone and email contacts with principal investigators on especially promising projects.
- ***University research.*** Search for pertinent literature through internet and library resources. Contact researchers at Northwestern University and at other universities directly.

Examine Pivotal Issues. After completing the survey, NUTC will examine the following issues.

- Explain why nanoscience is as promising and valuable to the aviation industry as it appears to be.
- Define boundary between nanoscience and nanotechnology.
- Relate micro-scale and nanoscale results.
- Applicability of each project to the aviation industry.
- Relevance of each project to FAA functions.